Mapes Crocker Project

Management Indicator Species Report

Plumas National Forest Service

Beckwourth Ranger District

Prepared by:

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Introduction

The purpose of this report is to evaluate and disclose the impacts of the Mapes Crocker Project on the ten (10) Management Indicator Species (MIS) identified in the Plumas National Forest (NF) Land and Resource Management Plan (LRMP) (USDA 1988) as amended by the Sierra Nevada Forests Management Indicator Species Amendment (SNF MIS Amendment) Record of Decision (USDA 2007). This report documents the effects of the proposed action and alternatives on the habitat of selected MIS.

MIS are animal species identified in the SNF MIS Amendment Record of Decision (ROD) signed December 14, 2007, which was developed under the 1982 National Forest System Land and Resource Management Planning Rule (1982 Planning Rule) (36 CFR 219). The current rule applicable to project decisions is the 2004 Interpretive Rule, which states "Projects implementing land management plans…must be developed considering the best available science in accordance with §219.36(a)…and must be consistent with the provisions of the governing plan." (Appendix B to §219.35). Guidance regarding MIS set forth in the 1988 Plumas LRMP as amended by the 2007 SNF MIS Amendment ROD directs Forest Service resource managers to (1) at project scale, analyze the effects of proposed projects on the habitat of each MIS affected by such projects, and (2) at the bioregional scale, monitor populations and/or habitat trends of MIS, as identified in the 1988 LRMP as amended.

Direction Regarding the Analysis of Project-Level Effects on MIS Habitat

Project-level effects on MIS habitat are analyzed and disclosed as part of environmental analysis under the National Environmental Policy Act (NEPA). This involves examining the impacts of the proposed project alternatives on MIS habitat by discussing how direct, indirect, and cumulative effects would change the habitat in the analysis area.

These project-level impacts to habitat are then related to broader scale (bioregional) population and/or habitat trends. The appropriate approach for relating project-level impacts to broader scale trends depends on the type of monitoring identified for MIS in the LRMP as amended by the SNF MIS Amendment ROD. Hence, where the Plumas NF LRMP as amended by the SNF MIS Amendment ROD identifies distribution population monitoring for an MIS, the project-level effects analysis for that MIS is informed by available distribution population monitoring data, which are gathered at the bioregional scale. The bioregional scale monitoring identified in the 1988 Plumas NF LRMP, as amended, for MIS analyzed for the Mapes Crocker Project is summarized in Section 3 of this report.

Adequately analyzing project effects to MIS generally involves the following steps:

- Identifying which habitat and associated MIS that would be either directly or indirectly affected by the project alternatives; these MIS are potentially affected by the project.
- Summarizing the bioregional-level monitoring identified in the LRMP, as amended, for this subset of MIS.
- Analyzing project-level effects on MIS habitat for this subset of MIS.
- Discussing bioregional scale habitat and/or population trends for this subset of MIS.
- Relating project-level impacts on MIS habitat to habitat and/or population trends at the bioregional scale for this subset of MIS.

These steps are described in detail in the Pacific Southwest Region's draft document "MIS Analysis and Documentation in Project-Level NEPA, R5 Environmental Coordination" (USDA 2006a). This MIS Report documents application of the above steps to select and analyze MIS for the Mapes Crocker Project.

Direction Regarding Monitoring of MIS Population and Habitat Trends at the Bioregional Scale.

The bioregional scale monitoring strategy for the Plumas NF's MIS is found in the Sierra Nevada Forests Management Indicator Species Amendment (SNF MIS Amendment) Record of Decision (ROD) of 2007 (USDA Forest Service 2007). Bioregional scale habitat monitoring is identified for all twelve of the terrestrial MIS. In addition, bioregional scale population monitoring, in the form of distribution population monitoring, is identified for all of the terrestrial MIS except for the greater sage-grouse (not a Plumas MIS). For aquatic macroinvertebrates, the bioregional scale monitoring identified is an Index of Biological Integrity and Habitat. The current bioregional status and trend of populations and/or habitat for each of the MIS is discussed in the 2010 Sierra Nevada Forests Bioregional Management Indicator Species (SNF Bioregional MIS) Report (USDA 2010a).

MIS Habitat Status and Trend.

All habitat monitoring data are collected and/or compiled at the bioregional scale, consistent with the LRMP as amended by the 2007 SNF MIS Amendment ROD (USDA 2007).

Habitats are the vegetation types (for example, early seral coniferous forest) or ecosystem components (for example, snags in green forest) required by an MIS for breeding, cover, and/or feeding. MIS for the Sierra Nevada National Forests represent 10 major habitats and 2 ecosystem components (USDA 2007), as listed in Table 1. These habitats are defined using the California Wildlife Habitat Relationship (CWHR) System (CDFG 2005). The CWHR System provides the most widely used habitat relationship models for California's terrestrial vertebrate species (ibid). It is described in detail in the 2010 SNF Bioregional MIS Report (USDA Forest Service 2010a).

Habitat status is the current amount of habitat on the Sierra Nevada Forests. Habitat trend is the direction of change in the amount of habitat over time. The methodology for assessing habitat status and trend is described in detail in the 2010 SNF Bioregional MIS Report (USDA Forest Service 2010a).

MIS Population Status and Trend.

All population monitoring data are collected and/or compiled at the bioregional scale and consistent with the LRMP as amended by the 2007 SNF MIS Amendment ROD (USDA 2007). The information is presented in detail in the 2010 SNF Bioregional MIS Report (USDA Forest Service 2010a).

Population monitoring strategies for MIS of the Plumas NF are identified in the 2007 Sierra Nevada Forests Management Indicator Species (SNF MIS) Amendment ROD (USDA Forest Service 2007). Population status is the current condition of the MIS related to the population monitoring data required in the 2007 SNF MIS Amendment ROD for that MIS. Population trend is the direction of change in that population measure over time.

There are a myriad of approaches for monitoring populations of MIS, from simply detecting presence to detailed tracking of population structure (USDA 2001, Appendix E, page E-19). A distribution population monitoring approach is identified for all of the terrestrial MIS in the 2007 SNF MIS Amendment, except for the greater sage-grouse (USDA Forest Service 2007). Distribution population monitoring consists of collecting presence data for the MIS across a number of sample locations over time, and tracks these changes in the distribution of each MIS at the Sierra Nevada scale by monitoring the changes in the presence of the species across a number of sample locations. Presence data are collected using a number of direct and indirect methods, such as surveys (population surveys), bird point counts, tracking number of hunter kills, counts of species sign (such as deer pellets), and so forth. The specifics regarding

how these presence data are analyzed to track changes in distribution over time vary by species and the type of presence data collected, as described in the 2010 SNF Bioregional MIS Report (USDA Forest Service 2010a).

Aquatic Macroinvertebrate Status and Trend.

For aquatic macroinvertebrates, condition and trend is determined by analyzing macroinvertebrate data using the predictive, multivariate River Invertebrate Prediction and Classification System (RIVPACS) (Hawkins 2003) to determine whether the macroinvertebrate community has been impaired relative to reference condition within perennial water bodies. This monitoring consists of collecting aquatic macroinvertebrates and measuring stream habitat features according to the Stream Condition Inventory (SCI) manual (Frasier et al. 2005). Evaluation of the condition of the biological community is based upon the "observed to expected" (O/E) ratio, which is a reflection of the number of species observed at a site versus the number expected to occur there in the absence of impairment. Sites with a low O/E scores have lost many species predicted to occur there, which is an indication that the site has a lower than expected richness of environmentally sensitive species and is therefore impaired.

Selection of Project level MIS

Management Indicator Species (MIS) for the Plumas NF are identified in the 2007 Sierra Nevada Forests Management Indicator Species (SNF MIS) Amendment (USDA Forest Service 2007). The habitats and ecosystem components and associated MIS analyzed for the Mapes Crocker Project were selected from this list of MIS, as indicated in Table 1. In addition to identifying the habitat or ecosystem components (1st column), the CWHR type(s) defining each habitat/ecosystem component (2nd column), and the associated MIS (3rd column), the table discloses whether or not the habitat of the MIS is potentially affected by the Mapes Crocker Project (4th column).

Table 1. Selection of MIS* for Project-Level Habitat Analysis for the Mapes Crocker Project

Habitat or Ecosystem Component	**CWHR Type(s) defining the habitat or ecosystem component[1]**	**Sierra Nevada Forests Management Indicator Species** ***Scientific Name***	**Category for Project Analysis [2]**
Riverine & Lacustrine	lacustrine (LAC) and riverine (RIV)	aquatic macroinvertebrates	3
Shrubland (west-slope chaparral types)	montane chaparral (MCP), mixed chaparral (MCH)	fox sparrow *Passerella iliaca*	3
Oak-associated Hardwoods & Hardwood/conifers	montane hardwood (MHW), montane hardwood-conifer (MHC)	mule deer *Odocoileus hemionus*	3
Riparian	montane riparian (MRI)	yellow warbler *Dendroica petechia*	3
Wet Meadow	Wet meadow (WTM), freshwater emergent wetland (FEW)	Pacific tree (Chorus) frog *Pseudacris regilla*	3
Early Seral Coniferous	ponderosa pine (PPN), Sierran mixed conifer (SMC), white fir (WFR), red fir (RFR), eastside pine (EPN), tree sizes 1, 2, and 3, all canopy closures	mountain quail *Oreortyx pictus*	3
Mid Seral Coniferous	ponderosa pine (PPN), Sierran mixed conifer (SMC), white fir (WFR), red fir	mountain quail *Oreortyx pictus*	3

	(RFR), eastside pine (EPN), tree size 4, all canopy closures		
Late Seral Open Canopy Coniferous	ponderosa pine (PPN), Sierran mixed conifer (SMC), white fir (WFR), red fir (RFR), eastside pine (EPN), tree size 5, canopy closures S and P	sooty (blue) grouse *Dendragapus obscurus*	3
Late Seral Closed Canopy Coniferous	ponderosa pine (PPN), Sierran mixed conifer (SMC), white fir (WFR), red fir (RFR), tree size 5 (canopy closures M and D), and tree size 6.	California spotted owl *Strix occidentalis occidentalis*	3
		northern flying squirrel *Glaucomys sabrinus*	3
Snags in Green Forest	Medium and large snags in green forest	hairy woodpecker *Picoides villosus*	3
Snags in Burned Forest	Medium and large snags in burned forest (stand-replacing fire)	black-backed woodpecker *Picoides arcticus*	3

* American Marten and Greater Sage Grouse are not MIS for the Plumas NF (USDA Forest Service 2007a)

1 All CWHR size classes and canopy closures are included unless otherwise specified; dbh = diameter at breast height; Canopy Closure classifications: S=Sparse Cover (10-24% canopy closure); P= Open cover (25-39% canopy closure); M= Moderate cover (40-59% canopy closure); D= Dense cover (60-100% canopy closure); Tree size classes: 1 (Seedling)(<1" dbh); 2 (Sapling)(1"-5.9" dbh); 3 (Pole)(6"-10.9" dbh); 4 (Small tree)(11"-23.9" dbh); 5 (Medium/Large tree)(>24" dbh); 6 (Multi-layered Tree) [In PPN and SMC] (Mayer and Laudenslayer 1988).

2 Category 1: MIS whose habitat is not in or adjacent to the analysis area and would not be affected by the project.

Category 2: MIS whose habitat is in or adjacent to analysis area, but would not be either directly or indirectly affected by the project.

Category 3: MIS whose habitat would be either directly or indirectly affected by the project.

The MIS whose habitat would be either directly or indirectly affected by the actions proposed for the Mapes Crocker Project, identified as Category 3 in Table 1, are carried forward in this analysis, which will evaluate the direct, indirect, and cumulative effects of the proposed action and alternatives on the habitat of these MIS.

The Mapes Crocker Project proposes to treat coniferous forest areas through mechanical thinning, hand thinning, masticating, grapple piling, and underburning and would directly or indirectly affect the following CWHR types: riverine, montane riparian, montane chaparral, grassland, early, mid, and late seral coniferous forest in all canopy cover and size classes, and medium and large snags in green forest. The CWHR type defining the habitat or ecosystem components represented for black-backed woodpecker would not be directly, indirectly or cumulatively impacted by the proposed action (snags in burned forest).

Bioregional Monitoring Requirements for MIS Selected for Project-Level Analysis

MIS Monitoring Requirements.

The Sierra Nevada Forests Management Indicator Species (SNF MIS) Amendment (USDA Forest Service 2007) identifies bioregional scale habitat and/or population monitoring for the Management Indicator Species for ten National Forests including the Plumas NF. The habitat and/or population monitoring requirements for Plumas NF's MIS are described in the 2010 Sierra Nevada Forests Bioregional Management Indicator Species (SNF Bioregional MIS) Report (USDA Forest Service 2010a) and are

summarized below for the MIS being analyzed for the Mapes Crocker Project. The applicable habitat and/or population monitoring results are described in the 2010 SNF Bioregional MIS Report (USDA Forest Service 2010a) and are summarized in Section 5 below for the MIS being analyzed for the Mapes Crocker Project.

Habitat monitoring at the bioregional scale is identified for all the habitats and ecosystem components, including the following analyzed for the Mapes Crocker Project: Riverine/lacustrine; grassland; shrubland/chaparral; montane riparian, early seral coniferous forest; mid seral coniferous forest; late seral open canopy coniferous forest; late seral closed canopy coniferous forest; snags in green forest.

Bioregional Monitoring for aquatic macroinvertebrates: Index of Biological Integrity (IBI) and habitat condition and trend are measured by collecting aquatic macroinvertebrates, and analyzing the resulting data using the River Invertebrate Prediction and Classification System (RIVPACS) (Hawkins 2003) to determine whether the macroinvertebrate community has been impaired relative to reference condition within perennial water bodies. In addition, stream habitat features are measured according to the Stream Condition Inventory (SCI) manual (Frasier et al. 2005).

Population monitoring at the bioregional scale for fox sparrow, yellow warbler, mountain quail, sooty grouse, California spotted owl, northern flying squirrel, and hairy woodpecker is based on distribution population monitoring. Distribution population monitoring consists of collecting presence data for the MIS across a number of sample locations over time (also see USDA 2001, Appendix E).

How MIS Monitoring Requirements are Being Met.

Habitat and/or distribution population monitoring for all MIS is conducted at the Sierra Nevada scale. Refer to the 2010 SNF Bioregional MIS Report (USDA 2010a) for details by habitat and MIS.

Description of Proposed Project.

Project design criteria include standards & guidelines identified in Table 2 of the Supplemental SNFPA (USDA 2004) Record of Decision, and the use of limited operating periods identified in Table 16 of the Mapes Crocker Project Biological Evaluation.

Geographic Analysis Area

The action area is defined as the units to be treated, which equals approximately 4,331 acres. The wildlife analysis area is the same for both terrestrial and aquatic species, comprised of 20,141 acres, 15,921 of which are on National Forest System lands. The watersheds delineated for analysis encompass areas where actions are proposed and/or cumulative effects with the proposed action are potentially significant.

Table 2. Summary of California Wildlife Habitat Relationships (CWHR) types within the Mapes Crocker Project wildlife analysis area (15,921 acres; all acres are approximate and National Forest System lands).

Seral Stage	CWHR Code	Acres of existing condition in analysis area	Acres of existing condition in units
Conifer Forest - Late Seral Closed Canopy	5M, 5D, 6	1,480	739

Conifer Forest - Late Seral Open Canopy	5P, 5S	102	27
Conifer Forest - Mid Seral, Closed-Dense Canopy	4M, 4D	4,396	2,004
Conifer Forest - Mid Seral, Open-Sparse Canopy	4S, 4P	2,793	936
Conifer Forest - Early Seral	Size Class 1-3	1,013	357
Hardwood Forest		33	6
Shrub Dominated		2,918	218
Grassland		919	44
Non-Vegetated		889	0
Burned at >50% Basal Area		1,379	0
Total*		15,921	4,331

Conifer forest includes EPN, RFR, SMC and WFR; Hardwood Forest includes ASP, MHC and MHW; Grassland includes AGS and WTM; Shrub dominated includes MRI, MCP and SGB; Non-vegetated includes BAR, and LAC. Size Class: 1 = Seedling Tree <1" dbh, 2 = Sapling Tree 1 - 6" dbh, 3 = Pole Tree 6 - 11" dbh, 4 = Small Tree 11 - 24"dbh, 5 = Medium/Large Tree >24"dbh,6 = Multi-layered Tree. Canopy Cover: D = Dense Canopy Cover (> 60%), M = Moderate Canopy Cover (40 - 59%), P = Open Canopy Cover (25 – 39%), S = Sparse Canopy Cover (10 – 24%). Vegetation Types: AGS = Annual Grassland; ASP = Aspen; BAR = Barren; EPN = Eastside Pine; LAC = Lacustrine; MCP = Montane Chaparral; MHC = Montane Hardwood-Conifer; MHW = Montane Hardwood; MRI = Montane Riparian; RFR = Red Fir; SGB = Sagebrush; SMC = Sierra Mixed Conifer; WFR = White Fir; WTM = Wet Meadow (Mayer and Laudenslayer 1988).

*Total acres may not add up to the displayed figures due to rounding.

Table 3. CWHR types in the Mapes Crocker Project wildlife analysis area and treatment units.

CWHR	Existing Condition	Acres Treated
AGS	915	44
ASP	2	2
BAR	12	0
EPN2	65	15
EPN3S	19	7
EPN3P	274	118
EPN3M	110	26
EPN3D	22	19
EPN4S	166	20
EPN4P	1855	696
EPN4M	3006	1315
EPN4D	499	312
EPN5P	69	24
EPN5M	777	317
EPN5D	178	123
LAC	878	0
MCP	1720	96
MHC4M	11	4

CWHR	Existing Condition	Acres Treated
MHC4D	4	0
MHW3S	3	0
MHW3P	7	0
MHW3D	7	0
MRI	5	2
RFR4P	9	4
RFR5P	3	2
RFR5M	30	30
SGB	1193	119
SMC2	59	3
SMC3S	12	4
SMC3P	44	12
SMC3M	120	48
SMC3D	224	66
SMC4S	141	12
SMC4P	508	142
SMC4M	492	193
SMC4D	339	148
SMC5P	30	1
SMC5M	201	107
SMC5D	219	102
WFR3P	3	0
WFR3M	13	8
WFR3D	50	32
WFR4S	32	13
WFR4P	82	49
WFR4M	50	28
WFR4D	10	9
WFR5M	74	59
WTM	4	0

All acres are approximate. Acres burned at high severity were not included in these figures.

Effects of Proposed Project on the Habitat for the Selected Project-Level MIS.

The following section documents the analysis for the following 'Category 3' species: aquatic macro invertebrates, fox sparrow, mule deer, yellow warbler, pacific tree frog, sooty grouse, mountain quail, California spotted owl, northern flying squirrel, and hairy woodpecker.

The analysis of the effects of the Mapes Crocker Project on the MIS habitat for the selected project-level MIS is conducted at the project scale. The analysis used the following habitat data: Forest wide vegetation typing into CWHR habitat classifications was done for the Plumas-Lassen Administrative Study in 2002 (Vestra, 2002). This vegetation layer is updated after fires on the Plumas NF using vegetation severity maps and aerial photos. Detailed information on the MIS is documented in the 2010 SNF Bioregional MIS Report (USDA Forest Service 2010a), which is hereby incorporated by reference.

Cumulative effects at the bioregional scale are tracked via the SNF MIS Bioregional monitoring, and detailed in the 2010 SNF Bioregional MIS Report (USDA Forest Service 2010a).

Lacustrine/Riverine Habitat (Aquatic Macroinvertebrates)

Habitat/Species Relationship.

Aquatic or Benthic Macroinvertebrates (BMI) were selected as the MIS for riverine and lacustrine habitat in the Sierra Nevada. They have been demonstrated to be very useful as indicators of water quality and aquatic habitat condition (Resh and Price 1984; Karr et al. 1986; Hughes and Larsen 1987; Resh and Rosenberg 1989). They are sensitive to changes in water chemistry, temperature, and physical habitat; aquatic factors of particular importance are flow, sedimentation, and water surface shade.

Benthic macroinvertebrates are invertebrates that live in water and can be seen by the unaided human eye. They provide an important ecological link between microscopic food organisms and fish. Benthic macroinvertebrates include insects, such as the commonly thought of mayflies, stoneflies, caddisflies, helgrammites and midges. Many of these groups are most highly developed for running water environments with adults and larvae living primarily in cold, running streams; many feed and breed under rocks, in the spaces among loose gravel and rocks, piles of waterlogged leaves and debris, and submerged logs.

Project-level Effects Analysis – Lacustrine/Riverine Habitat

Habitat Factor(s) for the Analysis:

Flow (perennial, intermittent, ephemeral); Sedimentation; and Water surface shade.

Reduced flows- as a result of changes in flow regime, lower flows could result in a permanent or temporal “drying” of existing habitat.

Increased sedimentation- An increase in delivery of sediment to channels could decrease RIVPACS scores by elimination of sensitive taxa and reduction in taxonomic richness.

Changes in temperature regime- Temperature changes resulting from canopy removal or changes in flow regime could affect timing of life history activities, such as breeding and migration, or affect abundance and distribution of sensitive taxa.

Current Condition of the Habitat Factor(s) in the Project Area:

The Mapes Crocker Wildlife Analysis Area has 878 acres of lacustrine habitat, with no acres in treatment units, and no acres of Riverine habitat (Table 3).

Direct and Indirect Effects to Habitat.

Project design elements, equipment exclusion zones, Best Management Practices (BMP's), and Standard and Guidelines (S&Gs), would be implemented for the proposed action. These design standards are designed to minimize habitat degradation by project implementation and protect or enhance downstream water quality. Areas adjacent to streams, referred to as Riparian Conservation Areas (RCAs), are managed differently than the rest of the landscape. In these areas, treatments are designed to ensure that riparian management objectives (RMOs) are met. Integrated Design Features are fully explained in the proposed action for the project.

With implementation of erosion control features in activity areas and adherence to stream buffer equipment exclusion areas, impacts to water quality from activity disturbed ground are not expected to be a significant factor in the event of precipitation that induces overland flow. The slight amounts of sediment generated from activity areas during a high runoff event over the landscape would not be measurable or detectable at the analysis watershed scale and would not affect identified downstream beneficial uses, including habitat occupied by macroinvertebrates (see the Mapes Crocker Project Hydrology and Soils Report).

Streams within the project area or the analysis area are not expected to change flow due to the implementation of the action alternatives. Changes in stream flow are not expected to increase with removal of trees through thinning. For example, all perennial streams are expected to remain perennial, all intermittent streams are expected to remain intermittent and the same for ephemeral streams. Flow will change depending on the water year.

Cumulative Effects to Habitat in the Project Area.

Past, present, and reasonably foreseeable future actions affecting the habitat in the project area have been identified in the project BE.

Cumulative Effects Conclusion:

The direct/indirect and cumulative effect of timber stand improvement through thinning, mechanical fuels reduction, use of prescribed fire, and wildlife habitat treatments would not change the existing amount of riverine or lacustrine habitat. Increases in sedimentation are expected to be temporary and minimized through BMPs, S&Gs, and project specific design elements. Cumulative effects to water quality could occur due to recent wildfires in and adjacent to the wildlife analysis area, see the project BE for more detailed discussion.

Summary of Aquatic Macroinvertebrate Status and Trend at the Bioregional Scale

The Plumas NF LRMP (as amended by the SNF MIS Amendment) requires bioregional-scale Index of Biological Integrity and Habitat monitoring for aquatic macroinvertebrates; hence, the lacustrine and riverine effects analysis for the Mapes Crocker Project must be informed by these monitoring data. The sections below summarize the Biological Integrity and Habitat status and trend data for aquatic macroinvertebrates. This information is drawn from the detailed information on habitat and population trends in the 2010 Sierra Nevada Forests Bioregional MIS Report (USDA Forest Service 2010a), which is hereby incorporated by reference.

Habitat and Index of Biological Integrity Status and Trend

Aquatic habitat has been assessed using Stream Condition Inventory (SCI) data collected since 1994 (Frasier et al. 2005) and habitat status information from the Sierra Nevada Ecosystem Project (SNEP) (Moyle and Randall 1996). Moyle and Randall (1996) developed a watershed index of biotic integrity

(IBI) based on distributions and abundance of native fish and amphibian species, as well as extent of roads and water diversions. According to this analysis, seven percent of the watersheds were in excellent condition, 36 percent were in good condition, 47 percent were in fair condition and nine percent were in poor condition.

Sierra Nevada MIS monitoring for aquatic (benthic) macroinvertebrates (BMI) was conducted in 2009 and 2010 (Furnish 2010). Benthic macroinvertebrates were collected from stream sites during both the 2009 and 2010 field seasons according to the Reachwide Benthos (Multihabitat) Procedure (Ode 2007). The initial BMI data from 2009 and 2010 found 46% (6 of 13) of the surveyed streams indicate an impaired condition and 54% (7 of 13) indicate a non-impaired condition (see USDA Forest Service 2010a, Table BMI-1). This is similar to the IBI conditions estimated by Moyle and Randall (1996). Therefore, current data from the Sierra Nevada indicate that status and trend in the RIVPACS scores appears to be stable.

Relationship of Project-Level Habitat Impacts to Bioregional-Scale Aquatic Macroinvertebrates Habitat Trend

In the short term, based on the indirect and cumulative effects of the proposed action, the status and trend of in-stream habitat and the macroinvertebrate community would not change from the existing condition, and thus would not alter the existing trend in the habitat or aquatic macroinvertebrates across the Sierra Nevada bioregion.

Shrubland (West-Slope Chaparral) Habitat (Fox Sparrow)

Habitat/Species Relationship.

The fox sparrow was selected as the MIS for shrubland (chaparral) habitat of the Sierra Nevada, comprised of montane chaparral (MCP) and mixed chaparral (MCH) as defined by the California Wildlife Habitat Relationships System (CWHR) (CDFG 2005). Recent empirical data from the Sierra Nevada indicate that, in the Sierra Nevada, the fox sparrow is dependent on open shrub-dominated habitats for breeding. The empirical data include six years of point count vegetation data and analysis from the Lassen National Forest (Burnett and Humple 2003, Burnett et al 2005) and analysis of the 2002-2006 data from the Plumas-Lassen Study (Sierra Nevada Research Center 2007).

Project-level Effects Analysis - Shrubland (Montane Chaparral) Habitat

Habitat Factor(s) for the Analysis:

1. Acres of shrubland (chaparral) habitat [CWHR montane chaparral (MCP) and mixed chaparral (MCH)]
2. Acres with changes in shrub ground cover class
3. Acres with changes in CWHR shrub size class

Current Condition of the Habitat Factor(s) in the Analysis Area

The analysis area supports approximately 1,720 acres of montane chaparral (MCP) and no mixed chaparral (MCH), making up approximately 11% of the vegetation within the analysis area.

Direct and Indirect Effects to Habitat

Approximately 96 acres of chaparral dominated land, are proposed for treatment. Within shrubland habitat the Mapes Crocker Project proposes to mechanically thin 79 acres, hand thin 8 acres, masticate or grapple pile 10 acres; all acres within treatment units could be treated with prescribed fire as a follow-up to other treatment types.

There would be no significant change in the amount and distribution of chaparral immediately following thinning. Mastication and grapple piling would result in a change in arrangement of patches of shrubs but would not decrease the availability of shrubland habitat. Prescribed fire would result in a change in the age class, with increased regeneration of chaparral. Fox sparrow are known to use open shrubland for nesting and ground foraging so the treatment would have no effect on fox sparrow.

Cumulative Effects to Habitat in the Analysis Area.

Past, present, and reasonably foreseeable future actions affecting the habitat in the analysis area have been identified in the Mapes Crocker Project BE.

Cumulative Effects Summary

Proposed actions on FS lands would result in no net loss or gain of chaparral habitat within the Mapes Crocker Project area. Therefore, there would be no cumulative effects to shrubland habitat or fox sparrow.

Summary of Fox Sparrow Status and Trend at the Bioregional Scale

The Plumas NF LRMP (as amended by the SNF MIS Amendment) requires bioregional-scale habitat and distribution population monitoring for the fox sparrow; hence, the shrubland effects analysis for the Mapes Crocker Project must be informed by both habitat and distribution population monitoring data. The sections below summarize the habitat and distribution population status and trend data for the fox sparrow. This information is drawn from the detailed information on habitat and population trends in the 2010 Sierra Nevada Forests Bioregional MIS Report (USDA Forest Service 2010a), which is hereby incorporated by reference.

Habitat Status and Trend

There are currently 1,009,681 acres of west-slope chaparral shrubland habitat on National Forest System lands in the Sierra Nevada. Over the last two decades, the trend is slightly increasing (changing from 8% to 9% of the acres on National Forest System lands).

Population Status and Trend

Monitoring of the fox sparrow across the ten National Forests in the Sierra Nevada has been conducted since 2009 in partnership with PRBO Conservation Science, as part of a monitoring effort that also includes mountain quail, hairy woodpecker, and yellow warbler (USDA 2010a, http://data.prbo.org/partners/usfs/snmis/). Fox sparrows were detected on 36.9% of 1659 point counts in 2009 and 44.3% of 2266 point counts in 2010, with detections on all 10 national forests in both years. The average abundance (number of individuals recorded on passive point count surveys) was 0.563 in 2009 and 0.701 in 2010. These data indicate that fox sparrows continue to be distributed across the 10 Sierra Nevada National Forests. In addition, the fox sparrows continue to be monitored and surveyed in the Sierra Nevada at various sample locations by avian point count, spot mapping, mist-net, and breeding bird survey protocols. These are summarized in the 2008 Bioregional Monitoring Report (USDA

2008). Current data at the range wide, California, and Sierra Nevada scales indicate that, although there may be localized declines in the population trend, the distribution of fox sparrow populations in the Sierra Nevada is stable.

Relationship of Project-Level Habitat Impacts to Bioregional-Scale Fox Sparrow Trend

For the Mapes Crocker Project, the amount and distribution of shrubland currently existing within the analysis area would change very little over time; there would be no net reduction or increase in the amount of shrubland habitat in the Mapes Crocker analysis area. Therefore the direct, indirect, and cumulative effects to shrubland habitat in the Mapes Crocker Project analysis area would not alter the existing trend in the habitat, nor would it lead to a change in the distribution of fox sparrows across the Sierra Nevada bioregion.

Oak-Associated Hardwoods and Hardwood/Conifer Habitat (Mule deer)

Habitat/Species Relationship.

The mule deer was selected as the MIS for oak-associated hardwood and hardwood/conifer in the Sierra Nevada, comprised of montane hardwood (MHW) and montane hardwood-conifer (MHC) as defined by the California Wildlife Habitat Relationships System (CWHR) (CDFG 2005). Mule deer range and habitat includes coniferous forest, foothill woodland, shrubland, grassland, agricultural fields, and suburban environments (CDFG 2005). Many mule deer migrate seasonally between higher elevation summer range and low elevation winter range (Ibid). On the west slope of the Sierra Nevada, oak-associated hardwood and hardwood/conifer areas are an important winter habitat (CDFG 1998).

Project-level Effects Analysis - Oak-Associated Hardwoods and Hardwood/Conifer Habitat

Habitat Factor(s) for the Analysis

1. Acres of oak-associated hardwood and hardwood/conifer habitat [CWHR montane hardwood (MHW), montane hardwood-conifer (MHC)].
2. Acres with changes in hardwood canopy cover
3. Acres with changes in CWHR size class of hardwoods

Current Condition of the Habitat Factor(s) in the Project Area

Approximately 33 acres of MHW/MHC habitat are present within the Mapes Crocker analysis area (Table 3). The majority of this habitat is composed of stands of conifers interspersed with small stands of broad-leaved trees often as a closed forest. Within the northern Sierra Nevada, common associates are California black oak, bigleaf maple, white alder, dogwood, Douglas-fir and ponderosa pine. Hardwood species present in the project area primarily consists of California black oak.

Direct and Indirect Effects to Habitat.

Approximately 21 acres of montane hardwood-conifer (MHC) are proposed for treatment (Table 3). The Mapes Crocker Project proposes to mechanically thin 4 acres in hardwood habitat. Thinning would open up the understory which would be beneficial to hardwood species, such as black-oak present in the

Mapes Crocker Project, and allow for the increased production of forbs; therefore this treatment should be beneficial to mule deer.

Cumulative Effects to Habitat in the Analysis Area.

Past, present, and reasonably foreseeable future actions affecting the habitat in the project area have been identified in the Mapes Crocker Project BE.

Cumulative Effects Summary

It is anticipated that implementation of the proposed action in combination with present and reasonably foreseeable future actions would increase the amount of oak-associated hardwoods and hardwood/conifer habitat by removing faster growing conifers, which eventually overtop and out-shade hardwood species. Thinning of competing conifers would allow for more hardwood regeneration which would enhance forage and habitat quality for mule deer.

Summary of Mule Deer Status and Trend at the Bioregional Scale

The Plumas NF LRMP (as amended by the SNF MIS Amendment) requires bioregional-scale habitat and distribution population monitoring for the mule deer; hence, the oak-associated hardwood and hardwood/conifer effects analysis for the Mapes Crocker Project must be informed by both habitat and distribution population monitoring data. The sections below summarize the habitat and distribution population status and trend data for the mule deer. This information is drawn from the detailed information on habitat and population trends in the Sierra Nevada Forests Bioregional MIS Report (USDA 2008), which is hereby incorporated by reference.

Habitat Status and Trend.

There are currently 809,000 acres of oak-associated hardwood and hardwood/mixed conifer habitat on National Forest System lands in the Sierra Nevada. The trend is slightly increasing (within the last decade, changing from 5% to 7% of the acres on National Forest System lands).

Population Status and Trend.

The mule deer has been monitored in the Sierra Nevada at various sample locations by herd monitoring (spring and fall) and hunter survey and associated modeling (CDFG 2007). California Department of Fish and Wildlife (CDFW, previously California Department of Fish and Game) conducts surveys of deer herds in early spring to determine the proportion of fawns that have survived the winter, and conducts fall counts to determine herd composition (CDFG 2007). This information, along with prior year harvest information, is used to estimate overall herd size, sex and age ratios, and the predicted number of bucks available to hunt (ibid). These data indicate that mule deer continue to be present across the Sierra Nevada, and current data at the range-wide, California, and Sierra Nevada scales indicate that, although there may be localized declines in some herds or Deer Assessment Units, the distribution of mule deer populations in the Sierra Nevada is stable.

Relationship of Project-Level Habitat Impacts to Bioregional-Scale Mule Deer Trend

The change in the composition of hardwood habitat in the Mapes Crocker Project analysis area would not alter the existing trend in the habitat, nor would it lead to a change in the distribution of mule deer across the Sierra Nevada bioregion.

Riparian Habitat (Yellow warbler)

Habitat/Species Relationship.

The yellow warbler was selected as the MIS for riparian habitat in the Sierra Nevada. This species is usually found in riparian deciduous habitats in summer (aspen, cottonwoods, willows, alders, and other small trees and shrubs typical of low, open-canopy riparian woodland) (CDFG 2005). Yellow warbler is dependent on both meadow and non-meadow riparian habitat in the Sierra Nevada (Siegel and DeSante 1999).

Project-level Effects Analysis – Riparian Habitat

Habitat Factor(s) for the Analysis:

1. Acres of riparian habitat (ASP and MRI).
2. Acres with changes in deciduous canopy cover
3. Acres with changes in total canopy cover
4. Acres with changes in CWHR size class

Current Condition of the Habitat Factor(s) in the Project Area

According to GIS data, approximately 7 acres of riparian habitat (2 acres ASP, 5 acres MRI) are present within the Mapes Crocker analysis area (Table 3). Additional acres of aspen not identified in the vegetation layer are known to exist in the Mapes Crocker project area (268 acres of aspen within treatment units have been identified to date). The majority of the MRI habitat is composed of the more shrub dominated patches and stringers of riparian growth typically found within conifer forests within the Sierra Nevada. Mechanical thinning is planned to occur on approximately 218 acres of ASP and MRI habitat and hand-thinning on approximately 51 acres; all units could receive prescribed fire as a follow-up to other treatments.

Direct and Indirect Effects of Proposed Action

Project design elements, equipment exclusion zones, Best Management Practices (BMP's), and Standard and Guidelines (S&Gs) would be implemented for the proposed action. Areas adjacent to streams, referred to as Riparian Conservation Areas (RCAs), are managed differently than the rest of the landscape. In these areas, treatments are designed to ensure that riparian conservation objectives (RCOs) are met. Project Design Elements are fully explained in the proposed action for the project. Key features include inner and outer zones within RCAs, and equipment exclusion zones (Table 4).

Additionally, some treatments within the Mapes Crocker Project will specifically target improving riparian habitat such as aspen stands. These treatments are expected to be generally beneficial for riparian habitat and species dependent upon riparian habitat, such as yellow warblers.

Table 4. Riparian Conservation Area widths, mechanical equipment exclusion zone widths and minimum distance to active ignition for prescribed fire activities.

Riparian Conservation Area (RCA)	RCA Designation Width	Equipment Exclusion Zone (EEZ) Minimum Distance	Burn Pile & Active Ignition Minimum Distance

		General Forest	Aspen & Meadow	
Perennial Streams	300 feet	*82-50 feet	*82-25 feet	*82-25 feet
Intermittent Streams	150 feet	*82-50 feet	*82-25 feet	*82-25 feet
Ephemeral Streams including other Hydrologic or Topographic Depressions without a Defined Channel	150 feet	15 feet	15 feet	15 feet
Special Aquatic Features (Reservoirs, Wetlands, Fens, and Springs)	300 feet	*82-50 feet	*82-25 feet	*82-25 feet

*The EEZ of 82 feet for perennial, intermittent and special aquatic features would apply within the units that are in the Walker Fire burned area, whereas all other units could have a smaller EEZ of 50 feet or 25 feet if approved by Wildlife Biologist after surveys for Sierra Nevada yellow-legged frogs are complete.

Cumulative Effects to Habitat in the Analysis Area.

Past, present, and reasonably foreseeable future actions affecting the habitat in the project area have been identified in the Mapes Crocker Project BE.

Cumulative Effects Conclusion:

It is expected that implementation of the proposed action in combination with present and reasonably foreseeable future actions would not significantly change the amount of riparian vegetation available but could increase available habitat in the long-term. Thinning of competing conifers could allow for increased regeneration of riparian vegetation, which is typically shade intolerant, which would enhance habitat quality for yellow warblers.

Summary of Yellow Warbler Status and Trend at the Bioregional Scale

The Plumas NF LRMP (as amended by the SNF MIS Amendment) requires bioregional-scale habitat and distribution population monitoring for the yellow warbler; hence, the riparian habitat effects analysis for the Mapes Crocker Project must be informed by both habitat and distribution population monitoring data. The sections below summarize the habitat and distribution population status and trend data for the yellow warbler. This information is drawn from the detailed information on habitat and population trends in the 2010 SNF Bioregional MIS Report (USDA 2010a), which is hereby incorporated by reference.

Habitat Status and Trend

There are currently 38,140 acres of riparian habitat on National Forest System lands in the Sierra Nevada. Over the last two decades, the trend is stable.

Population Status and Trend

Monitoring of the yellow warbler across the ten National Forests in the Sierra Nevada has been conducted since 2009 in partnership with PRBO Conservation Science, as part of a monitoring effort that also includes mountain quail, hairy woodpecker, and fox sparrow (USDA 2010a, http://data.prbo.org/partners/usfs/snmis/). Yellow warblers were detected on 13.7% of 160 riparian point counts in 2009 and 19.4% of 397 riparian point counts in 2010; additional detections were documented on upland point counts. The average abundance (number of individuals recorded on riparian passive point count surveys) was 0.166 in 2009 and 0.309 in 2010. In addition, the yellow warblers continue to be monitored and surveyed in the Sierra Nevada at various sample locations by

avian point count, spot mapping, mist-net, and breeding bird survey protocols. These are summarized in the 2008 Bioregional Monitoring Report (USDA 2008). Current data at the range-wide, California, and Sierra Nevada scales indicate that the distribution of yellow warbler populations in the Sierra Nevada is stable.

Relationship of Project-Level Habitat Impacts to Bioregional-Scale Yellow Warbler Trend

The Mapes Crocker Project would not alter the existing trend in the habitat, nor would it lead to a change in the distribution of yellow warbler across the Sierra Nevada bioregion.

Wet Meadow Habitat (Pacific tree frog)

Habitat/Species Relationship.

The Pacific tree frog was selected as an MIS for wet meadow habitat in the Sierra Nevada. This broadly distributed species requires standing water for breeding; tadpoles require standing water for periods long enough to complete aquatic development, which can be as long as 3 or more months at high elevations in the Sierra Nevada (CDFG 2005). During the day during the breeding season, adults take cover under clumps of vegetation and surface objects near water; during the remainder of the year, they leave their breeding sites and seek cover in moist niches in buildings, wells, rotting logs or burrows (ibid).

Project-level Effects Analysis – Wet Meadow Habitat

Habitat Factor(s) for the Analysis

1. Acres of wet meadow habitat (WTM)
2. Acres with changes in CWHR herbaceous height classes
3. Acres with changes in CWHR herbaceous ground cover classes
4. Changes in meadow hydrology

Current Condition of the Habitat Factor(s) in the Project Area

There are 4 acres typed as wet meadow (WTM) by CWHR data within the Mapes Crocker wildlife analysis area (Table 3). Additional meadow habitat such as AGR (915 acres) exists in the project area, portions of which may provide suitable habitat for pacific tree frogs.

Direct and Indirect Effects to Habitat.

Project activities are not planned on mapped WTM acres. Project activities within other meadow habitat (44 acres AGR) would act to reduce loss of seasonally wet meadow habitat due to conifer encroachment and improve meadow hydrology.

Cumulative Effects to Habitat in the Analysis Area

Past, present, and reasonably foreseeable future actions affecting the habitat in the project area have been identified in the Mapes Crocker Project BE.

Cumulative Effects Conclusion

Wet meadow habitat would be improved from current conditions.

Summary of Pacific Tree Frog Status and Trend at the Bioregional Scale

The Plumas NF LRMP (as amended by the SNF MIS Amendment) requires bioregional-scale habitat and distribution population monitoring for the Pacific tree frog; hence, the wet meadow effects analysis for the Mapes Crocker Project must be informed by both habitat and distribution population monitoring data. The sections below summarize the habitat and distribution population status and trend data for the Pacific tree frog. This information is drawn from the detailed information on habitat and population trends in the SNF Bioregional MIS Report (USDA Forest Service 2008), which is hereby incorporated by reference.

Habitat Status and Trend

There are currently 66,000 acres of wet meadow habitat on National Forest System lands in the Sierra Nevada. Within the last decade, the trend is stable.

Population Status and Trend

Since 2002, the Pacific tree frog has been monitored on the Sierra Nevada forests as part of the Sierra Nevada Forest Plan Amendment (SNFPA) monitoring plan (USDA Forest Service 2006b, 2007; Brown 2008). These data indicate that Pacific tree frog continues to be present at these sample sites, and current data at the range-wide, California, and Sierra Nevada scales indicate that the distribution of Pacific tree frog populations in the Sierra Nevada is stable.

Relationship of Project-Level Habitat Impacts to Bioregional-Scale Pacific Tree Frog Trend

The direct, indirect and/or cumulative effects of the Mapes Crocker Project with the proposed action would change very little the amount and distribution of WTM habitat currently existing within the analysis area; there would be no net reduction and an expected improvement in the long-term health and distribution of WTM in the Mapes Crocker analysis area. Therefore, the change in the amount of wet meadow habitat in the Mapes Crocker Project analysis area would not alter the existing trend in the habitat, nor would it lead to a change in the distribution of Pacific tree frogs across the Sierra Nevada bioregion.

Early and Mid-Seral Coniferous Forest Habitat (Mountain quail)

Habitat/Species Relationship.

The mountain quail was selected as the MIS for early and mid-seral coniferous forest (ponderosa pine, Sierran mixed conifer, white fir, red fir, and eastside pine) habitat in the Sierra Nevada. Early seral coniferous forest habitat is comprised primarily of seedlings (<1" dbh), saplings (1"-5.9" dbh), and pole-sized trees (6"-10.9" dbh). Mid seral coniferous forest habitat is comprised primarily of small-sized trees (11"-23.9" dbh). The mountain quail is found particularly on steep slopes, in open, brushy stands of conifer and deciduous forest and woodland, and chaparral; it may gather at water sources in the summer, and broods are seldom found more than 0.8 km (0.5 mi) from water (CDFG 2005).

Project-level Effects Analysis – Early and Mid-Seral Coniferous Forest Habitat

Habitat Factor(s) for the Analysis

1. Acres of early (CWHR tree sizes 1, 2, and 3) and mid seral (CWHR tree size 4) coniferous forest
2. Acres with changes in CWHR tree size class.
3. Acres with changes in tree canopy closure.
4. Acres with changes in understory shrub canopy closure.

Current Condition of the Habitat Factor(s) in the Analysis Area

Approximately 1,013 acres of early seral and 7,189 acres of mid seral conifer forest habitat are present within the Mapes Crocker analysis area (Table 3). The majority of this habitat is composed of eastside pine. Mid seral conifer forest makes up approximately 73% of the forest stands in the Mapes Crocker analysis area.

Direct and Indirect Effects to Habitat.

The Mapes Crocker Project would affect both early and mid-seral trees; mid-seral forest is the most prevalent in the project area and in the most need of thinning. The biggest change will be in density, opening up dense stands of small to medium sized trees. The proposed action would increase the amount of open canopy, early and mid-seral coniferous forest habitat while reducing the amount of closed canopy, early and mid-seral habitat. This change should benefit the mountain quail, since they prefer more open forested stands.

Approximately 31% (2,533 acres) of the early seral and mid seral conifer forest in the Mapes Crocker wildlife analysis area is proposed for mechanical thin under the proposed action. Additionally, 316 acres (4%) would be hand thinned, and 449 acres would receive mechanical fuels treatments (mastication, grapple pilling); all units could receive prescribed fire as a follow-up to other treatments. These treatments would not result in habitat type change for mountain quail. Overall, habitat and ecosystem components for mountain quail remain essentially the same as existing conditions, with no net decline in habitat with the proposed action alternative.

Cumulative Effects to Habitat in the Project Area

Past, present, and reasonably foreseeable future actions affecting the habitat in the project area have been identified in the project BE.

Cumulative Effects Conclusion

It is expected that implementation of the proposed action in combination with present and reasonably foreseeable future actions would not significantly change the amount of early or mid-seral habitat.

Summary of Mountain Quail Status and Trend at the Bioregional Scale

The Plumas NF LRMP (as amended by the SNF MIS Amendment) requires bioregional-scale habitat and distribution population monitoring for the mountain quail; hence, the early and mid-seral coniferous forest effects analysis for the Mapes Crocker Project must be informed by both habitat and distribution population monitoring data. The sections below summarize the habitat and distribution population status and trend data for the mountain quail. This information is drawn from the detailed information on habitat and population trends in the 2010 SNF Bioregional MIS Report (USDA Forest Service 2010a), which is hereby incorporated by reference.

Habitat Status and Trend

There are currently 530,851 acres of early seral and 2,776,022 acres of mid seral coniferous forest (ponderosa pine, Sierran mixed conifer, white fir, and red fir) habitat on National Forest System lands in the Sierra Nevada. Over the last two decades, the trend for early seral is decreasing (changing from 9% to 5% of the acres on National Forest System lands) and the trend for mid seral is increasing (changing from 21% to 25% of the acres on National Forest System lands).

Population Status and Trend

Monitoring of the mountain quail across the ten National Forests in the Sierra Nevada has been conducted since 2009 in partnership with PRBO Conservation Science, as part of a monitoring effort that also includes fox sparrow, hairy woodpecker, and yellow warbler (USDA Forest Service 2010a, http://data.prbo.org/partners/usfs/snmis/). Mountain quail were detected on 40.3 percent of 1659 point counts (and 48.6% of 424 playback points) in 2009 and 47.4% of 2266 point counts (and 55.3% of 492 playback points) in 2010, with detections on all 10 national forests in both years. The average abundance (number of individuals recorded on passive point count surveys) was 0.103 in 2009 and 0.081 in 2010. These data indicate that mountain quail continue to be distributed across the 10 Sierra Nevada National Forests. In addition, mountain quail continue to be monitored and surveyed in the Sierra Nevada at various sample locations by hunter survey, modeling, and breeding bird survey protocols. These are summarized in the 2008 Bioregional Monitoring Report (USDA Forest Service 2008).Current data at the range-wide, California, and Sierra Nevada scales indicate that the distribution of mountain quail populations in the Sierra Nevada is stable.

Relationship of Project-Level Habitat Impacts to Bioregional-Scale Mountain Quail Trend

Mechanical and hand thinning would open up the understory to allow the increased production of forbs that should be beneficial to mountain quail. The proposed action would not alter the existing trend in the habitat, nor would it lead to a change in the distribution of mountain quail across the Sierra Nevada bioregion.

Late Seral Open Canopy Coniferous Forest Habitat [Sooty (blue) grouse]

Habitat/Species Relationship.

The sooty grouse was selected as the MIS for late seral open canopy coniferous forest (ponderosa pine, Jeffery pine, Sierran mixed conifer, white fir, red fir, and eastside pine) habitat in the Sierra Nevada. This habitat is comprised primarily of medium/large trees (equal to or greater than 24 inches dbh) with canopy closures less than 40%. Sooty grouse occurs in open, medium to mature-aged stands of fir, Douglas-fir, and other conifer habitats, interspersed with medium to large openings, and available water, and occupies a mixture of mature habitat types, shrubs, forbs, grasses, and conifer stands (CDFG 2005). Empirical data from the Sierra Nevada indicate that Sooty Grouse hooting sites are located in open, mature, fir-dominated forest, where particularly large trees are present (Bland 2006).

Project-level Effects Analysis - Late Seral Open Canopy Coniferous Forest Habitat

Habitat Factor(s) for the Analysis

1. Acres of late seral open canopy coniferous forest, tree size 5, (canopy closures S and P).
2. Acres with changes in tree canopy closure class.
3. Acres with changes in understory shrub canopy closure class.

Current Condition of the Habitat Factor(s) in the Project Area

Approximately 102 acres of late seral open canopy conifer forest habitat are present within the Mapes Crocker analysis area, of which 27 acres overlap with proposed treatment units (Table 3).

Direct and Indirect Effects to Habitat.

The Mapes Crocker Project would have minimal effect to existing late seral open canopy coniferous forest. Thinning prescriptions throughout the project area would open up both the overstory and the understory, moving conditions within late-seral stands from closed canopy to open canopy. Additionally, treatments within mid-seral stands will promote growth into a late-seral size class, comprised primarily of open canopy conditions. Late-seral, open canopy habitat is expected to increase due to the proposed action. Approximately 461 acres of late seral closed canopy habitat (CWHR 5 M and D) would be converted to late seral open canopy forest. Some late seral open canopy forest could be removed if it occurs within the buffer of aspen, meadow, or spring treatments. however, of the 293 acres of these treatment types known to exist, there is no 5S or 5P habitat within the treatment buffer that would be removed. Of the 27 acres of late seral open canopy habitat within treatment units, 26 acres will be mechanically thinned and 1 acre will have mechanical fuels treatments; all units could receive prescribed fire as a follow-up to other treatments. Treatments would benefit late seral open canopy habitat by reducing risk of insect, disease, or high severity wildfire, as well as improve forage quality for sooty grouse.

Cumulative Effects to Habitat in the Project Area

Past, present, and reasonably foreseeable future actions affecting the habitat in the project area have been identified in the project BE. Recreational use, such as hunting sooty grouse, would have minimal additional impacts.

Cumulative Effects Conclusion

The proposed action would not result in any decrease in late seral open canopy habitat and is expected to increase late seral open canopy habitat. Project activities would not alter the existing trend in sooty grouse or late seral open canopy coniferous forest habitat.

Summary of Sooty Grouse Status and Trend at the Bioregional Scale

The Plumas NF LRMP (as amended by the SNF MIS Amendment) requires bioregional-scale habitat and distribution population monitoring for the sooty grouse; hence, the late seral open canopy coniferous forest effects analysis for the Mapes Crocker Project must be informed by both habitat and distribution population monitoring data. The sections below summarize the habitat and distribution population status and trend data for the sooty grouse. This information is drawn from the detailed information on habitat and population trends in the 2010 SNF Bioregional MIS Report (USDA Forest Service 2010a), which is hereby incorporated by reference.

Habitat Status and Trend

There are currently 63,795 acres of late seral open canopy coniferous forest (ponderosa pine, Sierran mixed conifer, white fir, red fir, and eastside pine) habitat on National Forest System lands in the Sierra Nevada. Over the last two decades, the trend is decreasing (changing from 3% to 1% of the acres on National Forest System lands).

Population Status and Trend

The sooty grouse has been monitored in the Sierra Nevada at various sample locations by hunter survey, modeling, point counts, and breeding bird survey protocols, including California Department of Fish and Game Blue (Sooty) Grouse Surveys (Bland 1993, 1997, 2002, 2006); California Department of Fish and Game hunter survey, modeling, and hunting regulations assessment (CDFG 2004a, CDFG 2004b); Multi-species inventory and monitoring on the Lake Tahoe Basin Management Unit (LTBMU 2007); and 1968 to present – BBS routes throughout the Sierra Nevada (Sauer et al. 2007). These data indicate that sooty grouse continue to be present across the Sierra Nevada, except in the area south of the Kern Gap, and current data at the range-wide, California, and Sierra Nevada scales indicate that the distribution of sooty grouse populations in the Sierra Nevada north of the Kern Gap is stable.

Relationship of Project-Level Habitat Impacts to Bioregional-Scale Sooty Grouse Trend

The direct, indirect, and cumulative effects of the Mapes Crocker Project would increase the number of acres of late seral open canopy forest within the analysis area. Prescribed fire and thinning treatments within stands may be beneficial to understory vegetation and actually make these stands, as well as some of the denser stands, more attractive to sooty grouse for summer and fall foraging. Proposed treatments would not alter the existing trend in the habitat, nor would it lead to a change in the distribution of sooty grouse across the Sierra Nevada bioregion.

Late Seral Closed Canopy Coniferous Forest Habitat (California spotted owl and Northern flying squirrel)

California spotted owl

The California spotted owl was selected as an MIS for late seral closed canopy coniferous forest (Douglas-fir, eastside pine, Jeffrey pine, ponderosa pine, red fir, Sierran mixed conifer, and white fir) habitat in the Sierra Nevada. This habitat is comprised primarily of medium/large trees (equal to or greater than 24 inches dbh) with canopy closures above 40% within Douglas-fir, eastside pine, Jeffrey pine, ponderosa pine, red fir, Sierran mixed conifer, and white fir coniferous forests, and multi-layered trees within Douglas-fir, eastside pine, Jeffrey pine, ponderosa pine, red fir, Sierran mixed conifer, and white fir forests. The California spotted owl is strongly associated with forests that have a complex multi-layered structure, large-diameter trees, and high canopy closure (CDFG 2005, USDI 2006). It uses dense, multi-layered canopy cover for roost seclusion. Roost selection appears to be related closely to thermoregulatory needs, and the species appears to be intolerant of high temperatures (CDFG 2005). Mature, multi-layered forest stands are required for breeding (Ibid). The mixed-conifer forest type is the predominant type used by spotted owls in the Sierra Nevada: about 80 percent of known sites are found in mixed-conifer forest, with 10 percent in red fir forest (USDA 2001).

Northern flying squirrel

The northern flying squirrel was selected as an MIS for late seral closed canopy coniferous forest (Douglas-fir, eastside pine, Jeffrey pine, ponderosa pine, red fir, Sierran mixed conifer, and white fir) habitat in the Sierra Nevada. This habitat is comprised primarily of medium/large trees (equal to or greater than 24 inches dbh) with canopy closures above 40% within Douglas-fir, eastside pine, Jeffrey pine, ponderosa pine, red fir, Sierran mixed conifer, and white fir coniferous forests, and multi-layered trees within Douglas-fir, eastside pine, Jeffrey pine, ponderosa pine, red fir, Sierran mixed conifer, and white fir. The northern flying squirrel occurs primarily in mature, dense conifer habitats intermixed with various riparian habitats, using cavities in mature trees, snags, or logs for cover (CDFG 2005).

Project-level Effects Analysis – Late Seral Closed Canopy Coniferous Forest Habitat

Habitat Factor(s) for the Analysis

1. Acres of late seral closed canopy coniferous forest habitat, tree size 5 (canopy closures M and D), and tree size 6.
2. Acres with changes in canopy closure.
3. Acres with changes in large down logs per acre or large snags per acre.

Current Condition of the Habitat Factor(s) in the Terrestrial Wildlife Analysis Area

Approximately 1,480 acres of late seral closed canopy conifer forest habitat are present within the Mapes Crocker Project wildlife analysis area, making up approximately 15% of coniferous forest habitat in the analysis area. Approximately 739 acres of late seral closed canopy conifer forest habitat overlap with proposed treatment units (Table 3).

Direct and Indirect Effects to Habitat

A total of 739 acres of late seral closed canopy conifer forest has been proposed for treatment. The Mapes Crocker Project proposes to mechanically thin 577 acres or 39% of the late seral closed canopy conifer habitat in the analysis area. Canopy cover in 461 acres (33%) of late seral closed canopy forest

would be reduced from dense (CWHR M or D) to open (CWHR S or P) canopy cover in eastside pine-type habitat. An additional 35 acres would be hand thinned, and 128 acres would receive mechanical fuels treatments. All acres would be treated with prescribed fire as a follow-up to other treatments.

The proposed action would reduce the amount of late seral closed canopy habitat in the project area. However, this habitat is a minor component of habitat available and sparsely distributed throughout the project area and does not currently support resident California spotted owls. Currently identified aspen treatments would remove approximately 12 acres of late seral closed canopy habitat through total tree removal in the 150-foot buffer area; more habitat could be removed if additional acres of aspen are found and late seral habitat exists in the buffer. Improved forest health and increased fire resiliency within the project area as a result of thinning activities are expected to outweigh the localized reduction in late seral closed canopy habitat and contribute to maintaining late seral closed canopy forest on the landscape.

The direct/indirect and cumulative effects of the action and no action alternatives on spotted owl are displayed and discussed in the Mapes Crocker Project BE. Refer to the BE for a more complete analysis. This MIS analysis addresses only impacts to late seral closed canopy coniferous forest.

Cumulative Effects to Habitat

Past, present, and reasonably foreseeable future actions affecting the habitat in the project area have been identified in the project BE. Cumulative effects on owl PACs, HRCAs, and suitable habitat are discussed in the Project BE.

Cumulative Effects Conclusion

It is anticipated that implementation of the proposed action, in combination with present and reasonably foreseeable future actions would not alter the existing trend in the late seral closed canopy coniferous forest habitat throughout the Sierra Nevada region. The proposed action may have a beneficial effect on the resilience of the landscape and reduce the threat of high severity wildfires that are currently threatening late seral closed canopy coniferous forest habitat throughout the Sierra Nevada region.

Summary of Status and Trend at the Bioregional Scale

California spotted owl and Northern flying squirrel

The Plumas NF LRMP (as amended by the SNF MIS Amendment) requires bioregional-scale habitat and distribution population monitoring for the California spotted owl and northern flying squirrel; hence, the late seral closed canopy coniferous forest habitat effects analysis for the Mapes Crocker Project must be informed by both habitat and distribution population monitoring data. The sections below summarize the habitat and distribution population status and trend data. This information is drawn from the detailed information on habitat and population trends in the 2010 SNF Bioregional MIS Report (USDA 2010a), which is hereby incorporated by reference.

Habitat Status and Trend

There are currently 1,006,923 acres of late seral, closed canopy coniferous forest (Douglas-fir, eastside pine, Jeffrey pine, ponderosa pine, red fir, Sierran mixed conifer, and white fir) habitats on National Forest System lands in the Sierra Nevada. Over the last two decades, the trend is slightly increasing (changing from 7% to 9% of the acres on National Forest System lands); since the early 2000s, the trend has been stable at 9%.

Population Status and Trend - California spotted owl

The California spotted owl has been monitored in California and throughout the Sierra Nevada through general surveys, monitoring of nests and territorial birds, and demography studies (Verner et al. 1992, Gutierrez et al. 2008. 2009, 2010, USDA 2001, 2004, 2006, USDI 2006, Sierra Nevada Research Center 2007, 2008, 2009, 2010). Current data at the rangewide, California, and Sierra Nevada scales indicate that, there may be localized declines in population trend [i.e., localized decreases in "lambda" (estimated annual rate of population change)], but the distribution of California spotted owl populations in the Sierra Nevada is stable.

The USFWS recently (November 8, 2019) released the finding that protection of the California spotted owl under the Endangered Species Act is not warranted (84 FR 60371, USDI 2019).

Population Status and Trend – Northern flying squirrel

The northern flying squirrel has been monitored in the Sierra Nevada at various sample locations by live-trapping, ear-tagging, camera surveys, snap-trapping, and radio telemetry on the Plumas and Lassen National Forests (Sierra Nevada Research Center 2007, 2008, 2009, 2010), and 1958-2004 throughout the Sierra Nevada in various monitoring efforts and studies (see USDA Forest Service 2008, Table NOFLS-IV-1). These data indicate that northern flying squirrels continue to be present at these sample sites, and current data at the rangewide, California, and Sierra Nevada scales indicate that the distribution of northern flying squirrel populations in the Sierra Nevada is stable.

Relationship of Project-Level Habitat Impacts to Bioregional-Scale Trends

California spotted owl

The Mapes Crocker Project would reduce the amount of late seral, closed canopy coniferous forest habitat within the wildlife analysis area. The Mapes Crocker project area exists at or even beyond the apparent eastern extent of spotted owl occurrence. This habitat type is sparsely distributed throughout the analysis area and does not currently support resident California spotted owls.

The indirect effect is that treated stands would be healthier and could provide late seral habitat in the future for spotted owls. Additionally, improving the resiliency of forested stands within the project area would reduce the risk of high severity fire within the project area spreading to adjacent areas with higher quality late seral close canopy habitat. Treatments within the Mapes Crocker Project would cause a reduction in the already limited availability of late seral closed canopy habitat within the project area, but could result in increased resiliency at a landscape level if treatments are effective at reducing the risk of high-severity wildfire. This reduction of habitat within the project area would not lead to a change in the distribution of California spotted owls across the Sierra Nevada bioregion, but could help maintain them in the present distribution if treatments are effective at improving the resiliency of the landscape.

Northern flying squirrel

The Mapes Crocker Project would reduce the amount of late seral, closed canopy coniferous forest habitat within the wildlife analysis area.

The indirect effect is that treated stands would be healthier and could provide late seral habitat in the future for flying squirrels. Treatments within the Mapes Crocker Project would cause a reduction in the already limited availability of late seral closed canopy habitat within the project area, but could result in increased resiliency at a landscape level if treatments are effective at reducing the risk of high-severity wildfire. This reduction of habitat within the project area would not lead to a change in the distribution

of flying squirrels across the Sierra Nevada bioregion, but could help to maintain them in the present distribution if treatments are effective at improving the resiliency of the landscape.

Snags in Green Forest Ecosystem Component (Hairy woodpecker)

Habitat/Species Relationship

The hairy woodpecker was selected as the MIS for the ecosystem component of snags in green forests. Medium (diameter breast height between 15 to 30 inches) and large (diameter breast height greater than 30 inches) snags are most important. The hairy woodpecker uses stands of large, mature trees and snags of sparse to intermediate density; cover is also provided by tree cavities (CDFG 2005). Mature timber and dead snags or trees of moderate to large size are apparently more important than tree species (Siegel and DeSante 1999).

Project-level Effects Analysis - Snags in Green Forest Ecosystem Component

Habitat Factor(s) for the Analysis

1. Green forest acres potentially supporting medium and large snags within the terrestrial wildlife analysis area (CWHR size class 4, 5, and 6).

Current Condition of the Habitat Factor(s) in the Terrestrial Wildlife Analysis Area

Based on the CWHR vegetation data, approximately 55% (8,770 acres) of the wildlife analysis area may be supporting medium to large (CWHR size class 4 and 5) snags.

Direct and Indirect Effects to Habitat

The proposed action would treat 42% (3,706 acres) of suitable habitat, likely reducing existing and future snags through thinning and prescribed fire activities. Snags would likely be both consumed and created through prescribed fire activities. Project design features would retain 3-6 of the largest snags per acre in conifer forest habitat; snags larger than 15 inches DBH and 20 feet in height would be used to meet this guideline. Because minimum snag levels would be retained, treated acres would remain suitable for hairy woodpecker. Green forest supporting snags within the analysis area that would not be treated under this project would continue to provide suitable habitat for hairy woodpecker.

Cumulative Effects to Habitat

The existing condition reflects the changes of all activities that have occurred in the past. The analysis of cumulative effects evaluates the impact on MIS habitat from the existing condition within the wildlife analysis area.

The fuelwood gathering and Christmas tree cutting programs on the PNF are ongoing programs that have been in existence for years and are expected to continue. The past and future effect of these actions has been to reduce the number of snags and down logs, while generally retaining continuous forest cover which would negatively affect snags in green forest habitat.

Cumulative Effects Conclusion

It is anticipated that implementation of the proposed action, in combination with present and reasonably foreseeable future actions (namely woodcutting), would have some cumulative effect to the population and habitat distribution across the Plumas National Forest.

Summary of Hairy Woodpecker Status and Trend at the Bioregional Scale

The Plumas NF LRMP (as amended by the SNF MIS Amendment) requires bioregional-scale habitat and distribution population monitoring for the hairy woodpecker; hence, the snag effects analysis for the Mapes Crocker Project must be informed by both habitat and distribution population monitoring data. The sections below summarize the habitat and distribution population status and trend data for the hairy woodpecker. This information is drawn from the detailed information on habitat and distribution population trends in the 2010 SNF Bioregional MIS Report (USDA 2010a), which is hereby incorporated by reference.

Ecosystem Component Status and Trend

The current average number of medium-sized and large-sized snags (≥ 15" dbh, all decay classes) per acre across major coniferous and hardwood forest types (westside mixed conifer, ponderosa pine, white fir, productive hardwoods, red fir, eastside pine) in the Sierra Nevada ranges from 1.5 per acre in eastside pine to 9.1 per acre in white fir. In 2008, snags in these types ranged from 1.4 per acre in eastside pine to 8.3 per acre in white fir (USDA 2008).

Data from the early-to-mid 2000s were compared with the current data to calculate the trend in total snags per acre by Regional forest type for the 10 Sierra Nevada national forests and indicate that, during this period, snags per acre increased within westside mixed conifer (+0.76), white fir (+2.66), productive hardwoods (+0.35), and red fir (+1.25) and decreased within ponderosa pine (-0.16) and eastside pine (-0.14).

Detailed information by forest type, snag size, and snag decay class can be found in the 2010 SNF Bioregional MIS Report (USDA 2010a).

Population Status and Trend

Monitoring of the hairy woodpecker across the ten National Forests in the Sierra Nevada has been conducted since 2009 in partnership with PRBO Conservation Science, as part of a monitoring effort that also includes mountain quail, fox sparrow, and yellow warbler (USDA 2010b, http://data.prbo.org/partners/usfs/snmis/). Hairy woodpeckers were detected on 15.1% of 1659 point counts (and 25.2% of 424 playback points) in 2009 and 16.7% of 2266 point counts (and 25.6% of 492 playback points) in 2010, with detections on all 10 national forests in both years. The average abundance (number of individuals recorded on passive point count surveys) was 0.116 in 2009 and 0.107 in 2010. These data indicate that hairy woodpeckers continue to be distributed across the 10 Sierra Nevada National Forests. In addition, the hairy woodpeckers continue to be monitored and surveyed in the Sierra Nevada at various sample locations by avian point count and breeding bird survey protocols. These are summarized in the 2008 Bioregional Monitoring Report (USDA 2008). Current data at the rangewide, California, and Sierra Nevada scales indicate that the distribution of hairy woodpecker populations in the Sierra Nevada is stable.

Relationship of Project-Level Habitat Impacts to Bioregional-Scale Hairy Woodpecker Trend

The direct, indirect, and cumulative effects of the Mapes Crocker Project, in terms of potential medium-sized and large-sized snags per acre within green forest habitat, would change with time the amount and distribution of snags in green forest habitat within the wildlife analysis area. However, it will not lead to a change in the distribution of hairy woodpecker across the Sierra Nevada bioregion.

Snags in Burned Forest Ecosystem Component (Black-backed woodpecker)

Habitat/Species Relationship.

The black-backed woodpecker was selected as the MIS for the ecosystem component of snags in burned forests. Recent data indicate that black-backed woodpeckers are dependent on snags created by stand-replacement fires (Hutto 1995, Kotliar et al. 2002, Smucker et al. 2005, Tingley et al. 2020, Campos et al. 2020). The abundant snags associated with severely burned forests provide both prey (by providing food for the specialized beetle larvae that serve as prey) and nesting sites (Hutto and Gallo 2006).

However, when forests burn at high severity, most trees are killed in a single pulse and subsequent decay rates and black-woodpecker occupancy rates are limited in duration to a shorter time period (White et al. 2017). When forests burn at lower fire severity, mortality rates are extended and trees die over many years, and this allows black-backed woodpecker populations to subsist at these sites for a decade (Saracco et al. 2011, White et al. 2017). Campos et al. (2020) found that black-backed woodpeckers utilize dense burned forest habitat most commonly when in juxtaposition to areas with green forest habitats or areas that burned at lower fire severity. Large expanses of high severity fire were used less.

Project-level Effects Analysis – Snags in Burned Forest Ecosystem Component

Habitat Factor(s) for the Analysis:

1. Medium (11-30 inches dbh) snags per acre within burned forest created by stand-replacing fire.
2. Large (greater than 30 inches dbh) snags per acre within burned forest created by stand-replacing fire.

Current Condition of the Habitat Factor(s) in the Project Area:

The Mapes Crocker Project wildlife analysis area contains approximately 1,379 acres (9%) of burned area, no burned acres are within Mapes Crocker Project treatment units. The area of the Mapes Crocker Project that burned in the Dixie Fire provides burned forest habitat that could be utilized by species such as the black-backed woodpecker.

Direct and Indirect Effects to Habitat.

The Mapes Crocker Project does not propose to treat burned forest habitat.

Within green areas of the Mapes Crocker Project, treatments would reduce the risk of high severity fire that could provide future burned snag habitat. However, research indicates that black-backed woodpeckers prefer areas burned at mixed severity and avoid large patches of high severity burn (Stillman et al. 2019a, Stillman et al. 2019b). Treatments are expected to reduce the risk of further stand replacing wildfire, and result in lower-intensity or mixed severity burn conditions, which could result in higher quality black-backed woodpecker habitat if a fire were to occur.

Underburning activities in the Mapes Crocker Project area may result in the mortality of some medium and large trees which would be beneficial to recruitment of snag habitat. Black-backed woodpeckers have been observed in areas on the Beckwourth District shortly after prescribed fire treatment (NRIS database and FACTS database accessed 2021).

Cumulative Effects to Habitat in the Analysis Area.

Variable density thinning in green forest area will reduce potential for high severity fire overall within the analysis area while leaving patches of higher tree density that could result in recruitment of snag habitat under fire conditions. Reduced density and improved forest health will allow stands to develop larger trees in the future, which could become important black-backed woodpecker habitat if the area burns at mixed severity.

Approximately 830,000 acres of Plumas National Forest lands have burned in wildfires between 2019-2021, providing a sizeable increase in black-backed woodpecker habitat on PNF. Preserving currently green forest by reducing wildfire risk will be beneficial to future black-backed woodpecker habitat in the long-term as currently burned habitat declines in suitability over time.

Cumulative Effects Conclusion

It is expected that implementation of the proposed action, in combination with present and reasonably foreseeable future actions, could result some negative cumulative effects to the habitat within the analysis area by reducing stand densities that could provide suitable habitat if burned at high-severity and removing trees of the size class typically used for nesting if the stand were to burn, but would not affect population and habitat distribution across the Plumas National Forest.

Summary of Black-backed Woodpecker Status and Trend at the Bioregional Scale

The Plumas NF LRMP (as amended by the SNF MIS Amendment) requires bioregional-scale habitat and distribution population monitoring for the black-backed woodpecker; hence, the snags effects analysis for the Mapes Crocker Crocker Project must be informed by both habitat and distribution population monitoring data. The sections below summarize the habitat and distribution population status and trend data for the black-backed woodpecker. This information is drawn from the detailed information on habitat and distribution population trends in the 2010 SNF Bioregional MIS Report (USDA Forest Service 2010a), which is hereby incorporated by reference.

Ecosystem Component Status and Trend

The average number of medium-sized and large-sized snags (> 15" dbh, all decay classes) per acre across major coniferous and hardwood forest types (westside mixed conifer, ponderosa pine, white fir, productive hardwoods, red fir, eastside pine) in the Sierra Nevada calculated in 2008 ranged from 1.5 per acre in eastside pine to 9.1 per acre in white fir. In 2008, snags in these forest types ranged from 1.4 per acre in eastside pine to 8.3 per acre in white fir (USDA Forest Service 2008). More recent data on current number of snags has not been calculated.

Data from the early-to-mid 2000s were compared with the 2008 data to calculate the trend in total snags per acre by Regional forest type for the 10 Sierra Nevada national forests and indicate that, during this period, snags per acre increased within westside mixed conifer (+0.76), white fir (+2.66), productive hardwoods (+0.35), and red fir (+1.25) and decreased within ponderosa pine (-0.16) and eastside pine (-0.14).

Detailed information by forest type, snag size, and snag decay class can be found in the 2010 SNF Bioregional MIS Report (USDA Forest Service 2010a).

These data include snags in both green forest and burned forest. Between 2000 and 2007, 211,000 acres underwent severe burn and 176,000 acres underwent moderate burn in the Sierra Nevada. Between

2019-2021, wildfire burned through approximately 830,000 acres on Plumas National Forest alone. These fires have dramatically increased the amount of available burned forest habitat on PNF.

Population Status and Trend

Monitoring of the black-backed woodpecker across the 10 National Forests in the Sierra Nevada has been conducted since 2008 in partnership with the Institute for Bird Populations (IBP) (USDA Forest Service 2010a, http://www.birdpop.org/Sierra/bbwo.htm). In 2008, black-backed woodpeckers were detected at 68 survey stations distributed across 10 of the 19 fire areas surveyed. In 2009, black-backed woodpeckers were detected at 169 survey station distributed across 28 of the 51 fire areas surveyed. In both years, occupied sites were well distributed across the Sierra Nevada national forests, included burned areas of a variety of sizes, and included areas 1 to 10 years post-fire. These data indicate that black-backed woodpeckers continue to be distributed across the 10 Sierra Nevada National Forests. Additionally, mean occupancy probability for stations surveyed during 2009 was 0.253 (95% credible interval: 0.222 – 0.289); applying this probability across the 10 national forests yields an estimate that approximately 81,814 ha (25.3%) (range of 71,921 – 93,610 ha) of the 323,358 ha of burned forest (burned between 1999 and 2008) on the ten national forest units within monitoring area was occupied by Black-backed Woodpeckers in 2009. In addition, the black-backed woodpeckers continue to be surveyed in the Sierra Nevada at various sample locations by avian point count, spot mapping, mist-net, and breeding bird survey protocols. These are summarized in the 2008 Bioregional Monitoring Report (USDA Forest Service 2008). Current data at the rangewide, California, and Sierra Nevada scales indicate that the distribution of black-backed woodpecker populations in the Sierra Nevada is stable.

Relationship of Project-Level Habitat Impacts to Bioregional-Scale Black-Backed Woodpecker Trend

The Mapes Crocker Project would not lead to a change in the distribution of black-backed woodpecker across the Sierra Nevada bioregion.

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